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February 19, 2010

To: Service List

Re: Docket No. 2008-0273; In the Matter of Public Utilities Commission Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs

Enclosed please find information requests ("IRs") prepared by the Commission's consultants, the National Regulatory Research Institute and the National Renewable Energy Laboratory, for the above-referenced docket. Please respond to the attached information requests by March 4, 2010.

Please contact the undersigned if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Stacey Kawasaki Djou".

Stacey Kawasaki Djou
Commission Counsel

SKD:laa

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Information Requests

PUC-IR-301

Please list each of the model inputs used to calculate each of the proposed rates in the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement. For each input, please provide references for the source of the data. (For example, site the source of any data used for solar PV modules.) For each of the following that the HECO Companies do not include in calculations, please describe why it was not considered. Inputs should include but not be limited to the following:

- (a) Capital purchase costs
- (b) Land
- (c) Transportation costs
- (d) Installation costs (labor)
- (e) Economic life
- (f) Depreciation term
- (g) Income tax rate and calculations
- (h) Annual operating cost
- (i) Weighted average cost of capital
- (j) Insurance costs
- (k) Salvage/cleanup costs at the end of useful life
- (l) Interconnection costs (net of metering)
- (m) Interconnection Requirements Study costs
- (n) Meter costs
- (o) Annual capacity factor
- (p) Degradation factor
- (q) Sales tax
- (r) Property taxes
- (s) Permitting costs
- (t) Engineering costs (other than interconnection studies)

PUC-IR-302

Please provide the basis for the 9% discount rate used to calculate levelized rates in Attachment 4 of HECO's Comments on the Alternative FIT Tariff and Standard Agreement. Provide a full and detailed narrative explanation, including citations when available, supporting the used discount rate. Specifically, why should the discount rate not equal the overall rate of return?

PUC-IR-303

According to page 7 of the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement:

"Hawaiian Electric Companies focused on the higher end of both size ranges (20 kW for Tier 1 and 500 kW for Tier 2) to set the tariff at a rate that will facilitate the development of projects but also take advantage of economies of scale."

- (a) Describe how HECO modeled both the costs and the performance associated with these larger-scale projects.

- (b) Would Tier 1 solar rates be sufficient to facilitate residential PV solar projects that are typically between 5 and 10 kW? Please provide comparative calculations for the 7-kW projects.
- (c) Would Tier 2 rates facilitate commercial rooftop solar PV projects (most of which would be larger than 20 kW but smaller than 500 kW)? Please provide comparative calculations for the 100-kW projects.
- (d) Explain why 500 kW is likely to be the size for most Tier 2 projects.

PUC-IR-304

Please provide the following reports cited on page 8 of the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement:

- (a) Black & Veatch for NREL
- (b) 2006 Navigant for Arizona's Solar Electric Roadmap

PUC-IR-305

Please provide a narrative explanation and supporting documentation for shipping costs to Hawaii assumed in all rates in the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement.

PUC-IR-306

Please describe to what extent the rates in the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement utilized Hawaii-specific cost or performance information based on existing Hawaii solar PV and small wind projects. List any projects from which rates were derived and the PPA rates these projects receive.

PUC-IR-307

According to page 9 of the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement:

"The midpoint of Tier 2 total installed cost is roughly \$2000/kW. To incorporate the full range of project costs, E3 also assessed costs on installed in-line hydro units in Hawaii. All three projects identified in the State have additional construction costs which represent an undefined portion of the total cost. Thus, the costs shown should represent a conservative high end. The actual installed projects do not show the clear economies of scale relationship seen in the cost of generation analysis. Other factors seem to drive the installed cost in these three cases—most likely siting/development-related costs."

Please provide a full and detailed narrative explanation for your assumption that whatever factors driving the higher-than-expected installed capacity costs for past projects will not recur with future projects. On what basis do you conclude that these costs are anomalous?

PUC-IR-308

Why are the Tier 1 CSP low and high LROC figures in the first paragraph of page 11 of the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement the same as those in the third paragraph of page 11, which assume the use of the 24.5% refundable state tax credit?

PUC-IR-309

With respect to the third paragraph on page 11 of the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement, why is the midpoint of the Tier 1 range of the project LCOE higher than the "high" LCOE? Please clarify the correct figures in the paragraph, including the midpoint of the range, and clarify what assumptions are correct.

PUC-IR-310

Why did page 11 of the HECO Companies' proposed Tier 1 and Tier 2 Tariff and Agreement assume a 20-year debt term? Please provide evidence that this is the typical debt term for Tier 1- and Tier 2-sized projects.

PUC-IR-311

According to Section 6(b) of the HECO Companies' proposed Tier 1 and Tier 2 rates:

- (b) The Company shall not be required to purchase energy during any period during which, due to operational circumstances, purchases from the Seller will result in costs greater than those which the Company would incur if it did not make those purchases, but instead generated an equivalent amount of energy itself. The Company shall provide the Seller with at least twenty-four (24) hours advance oral or written notice of any such period to allow the Seller to cease the delivery of energy to the Company. The Company and the Seller will work to develop a mutually acceptable format for this notice, including, but not limited to, a listing of typical parameters that define anticipated constraints in purchases from the Seller. If the Company fails to provide such notice, it will pay the same rate for such purchase of energy as would be required had the period not occurred. Without limiting the foregoing, conditions when curtailment of energy delivery by the Seller may be implemented by the Company may include when, during excess energy conditions, the Company would have to (i) cycle off-line any Base Load Unit, or (ii) remove one or more components of a combined cycle unit (such as shutting off one combustion turbine or one combustion turbine and the steam turbine of a dual-train combined cycle unit (consisting of two combustion turbines and one steam turbine)) in order to purchase energy from the Seller. The Company shall not curtail pursuant to this Section 6(b) of the Agreement solely as a consequence of the Company's filed Avoided Energy Cost Data being lower than the applicable energy payment rate paid to the Seller under this Agreement.
- (a) Do any Commission regulations or portions of the D&O in this docket authorize HECO to curtail as-available renewable resources for economic reasons? Please cite any such provisions.
- (b) Do the the HECO Companies currently curtail renewable energy units for economic reasons? If so, describe (1) the reasons for such curtailment, (2) what units are typically curtailed, and (3) the frequency of such curtailment.

- (c) How did the HECO Companies factor potential curtailment into the capacity factor data used to calculate rates? What percentage of otherwise available hours for each technology and size tier do the HECO Companies project that they would curtail?

PUC-IR-312

According to the HECO Companies' Tier 1 and Tier 2 proposal:

"The energy payment rates specified in paragraph G(l) are based on the 35% Hawaii state renewable energy technologies income tax credit as prescribed in the Hawaii state tax code, Hawaii Revised Statutes ("HRS") Section 235-12.5. If the Seller provides written documentation at the time of application under this Schedule FIT that the Seller will elect the lax credit refund provision for solar energy technologies as provided in HRS Section 235- 12.5(g), and prior to the Commercial Operation Date provides a copy of the actual tax filing to the Sate Department of Taxation documenting this election, the Company shall pay for each kilowatt-hour ("kWh") of electric energy delivered to the Company by Seller as follows."

According to DBEDT's website:

Available Tax Credits

Solar Thermal System (solar water heaters) 35% tax credit	<u>Effective Date</u> Installed and placed in service after July 1, 2006
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Single family residential property: 35% of actual cost or \$2,250, whichever is less.

Multi-family residential property: 35% of actual cost or \$350 per unit, whichever is less.

Commercial property: 35% of actual cost or \$250,000, whichever is less.

Wind System 20% tax credit	<u>Effective Date</u> Installed and placed in service after July 1, 2006
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Single family residential property: 20% of actual cost or \$1,500, whichever is less.

Multi-family residential property: 20% of actual cost or \$200 per unit, whichever is less.

Commercial property: 20% of actual cost or \$500,000, whichever is less.

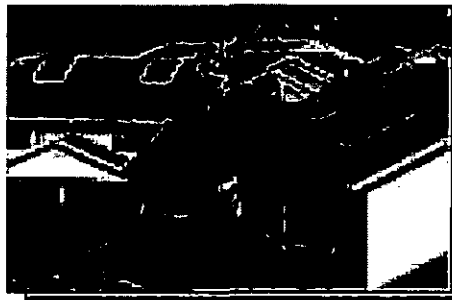
Photovoltaic (PV) System 35% tax credit	<u>Effective Date</u> Installed and placed in service after July 1, 2006
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Single family residential property: 35% of actual cost or \$5,000, whichever is less.

Multi-family residential property: 35% of actual cost or \$350 per unit, whichever is less.

Commercial property: 35% of actual cost or \$500,000, whichever is less.

Multiple owners of a single system (solar thermal, PV, or wind) are entitled to a single tax credit that shall be apportioned between the owners in proportion to their contribution to the cost of the system.



Many residential solar PV projects cost roughly \$30,000, so the tax credit, which caps at \$2,250 for single-family homes, would not cover 35% of total costs as calculated (or even \$24.5%). The same dynamic could occur for larger PV as well as wind systems. How do rate calculations consider caps on state tax credits?

PUR-IR-313

According to page 62 of the D&O:

"In reviewing the record, the commission finds that FIT rates 'should support a typical or average project that is reasonably cost-effective..."

According to page 9 of the HECO Companies' Tier 1 and Tier 2 FIT proposal:

"For Tier 1 projects with a capacity factor higher than 26%, which targets better wind sites and **more cost effective projects**, the LCOE ranged from \$117/MWh on the low end to \$205/MWh on the high end with installed costs between \$5000/kW and \$7000/kW and capacity factors between 26-32% (with losses included). \$ 161 is the midpoint of the range and is the proposed FIT rate for Tier 1 wind projects... The definition targets low environmental impact hydro projects. Selecting the middle range of capacity factor focuses the rate on **more cost-effective opportunities**."

(emphasis added)

Provide comparative calculations for average projects.

PUC-IR-314

According to the HECO Companies' proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement:

"Except with the written consent of the Company, which consent shall not be unreasonably withheld, each physical address (defined as a single residential address or a single lax map key if a commercial or industrial facility) may not have more than one Facility of the same technology type contracted under this Schedule FIT."

Under what specific conditions would the HECO Companies allow or withhold consent for multiple facilities of the same type? Why is this "one facility" limitation necessary and in the public interest?

PUC-IR-315

According to the HECO Companies' proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement:

"Pursuant to Section 5 (Personnel and Company System Safety) and Section 6 (Continuity of Service) of the Agreement, the Company may at times have limited ability to integrate energy produced by the Seller into the Company System for engineering and/or operating reasons and may be required to curtail energy deliveries by the Seller."

Please provide a detailed list of the reasons for curtailment. Specify the reasons for which the HECO Companies have already curtailed renewable energy and which reasons are hypothetical.

PUC-IR-316

According to the HECO Companies' proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement:

"The Company shall install, maintain and periodically test such meters as the Company deems appropriate and shall be reimbursed by Seller for all reasonably incurred costs for such installation, maintenance and testing work."

- (a) Do the HECO Companies currently assess such charges to (a) customers, or (b) interconnected facilities from whom they purchase power?
- (b) Please estimate (a) the initial costs of meter installation, and (b) ongoing annual maintenance and testing work.
- (c) Are the costs described in Part B above included in the calculation of rates? If so, please describe how they are incorporated. If not, describe why they have been omitted from such rate calculations.

PUC-IR-317

According to the HECO Companies' proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement:

"Seller shall provide or cause to be provided to Company on a timely basis, as reasonably determined by Company, all information, including but not limited to information that may be obtained in any audit referred to below (the "Information"), reasonably requested by Company for purposes of permitting Company and Hawaiian Electric Industries, Inc. ("HEI") to comply with the requirements (initial and on-going) of (i) identifying variable interest entities and determining primary beneficiaries under the accounting principles of Financial Accounting Standards Board ("FASB") Accounting Standards Codification 810, Consolidation ("FASB ASC 810"); (ii) Section 404 of the Sarbanes-Oxley Act of 2002 ("SOX 404"); and (iii) all clarifications, interpretations and revisions of and regulations implementing FASB ASC 810 and SOX 404 issued by the FASB, Securities and Exchange Commission, the Public Company Accounting Oversight Board, Emerging Issues Task Force or other governing agencies."

- (a) How could the above referenced reporting go beyond the reporting requirements listed in the Commission D&O? Provide a specific list as known or expected today.
- (b) What specific information might the Company require of residential solar and wind project owners?

PUC-IR-318

According to the HECO Companies' proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement:

"If any of the following conditions occur during the FIT Term, then the Company shall have the right to terminate this Agreement:

- (ii) The Seller makes a general assignment for the benefit of its creditors;
- (iii) The Seller files bankruptcy, has a petition for involuntary bankruptcy filed against it, or has a receiver appointed because of insolvency;
- (iv) The Seller's dissolution or liquidation..."

Why should the HECO Companies have the right to terminate the Agreement in the event of the financial events listed above? What is the benefit to Hawaii ratepayers of such a right, and why would the HECO Companies or the ratepayers be harmed in its absence? Why would these contracts not be assigned to the HECO Companies' successor except as ordered by the Commission or bankruptcy court? Is this needed, or can the Commission or bankruptcy court make these decisions if insolvency occurs?

PUC-IR-319

Do the HECO Companies now curtail intermittent generators based on vintage, with newest generators curtailed first? If so, do the HECO Companies propose to continue this policy under their proposed feed-in tariff or move to a different policy? If not, in what order are generators currently curtailed and how, if at all, would that change under the feed-in tariff?

PUC-IR-320

Please describe any harm done to the HECO Companies or their ratepayers if project owners sell power elsewhere when they are curtailed.

PUC-IR-321

Please confirm or deny Solar Alliance's assertion that the SCADA trigger is now 1 MW but is proposed by MPC to be 0.5 MW and would also include "all other Facilities, regardless of size, where it is deemed, at the company's sole discretion, that an alternate means of curtailment is currently feasible." If so, please describe why the HECO Companies are changing the SCADA trigger and why it is necessary to have such procedures for projects below 1 MW.

PUC-IR-322

Please describe the service charges assessed to variously sized projects receiving power purchase agreements from the HECO Companies.

PUC-IR-323

Please describe the basis for the specific level of the \$25-per-month service charge described in the HECO Companies' proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement.

PUC-IR-324

Was the \$25 service charge included in the HECO Companies' Tier 1 and Tier 2 rate calculations? If not, why was this cost excluded? If so, how was it incorporated?

PUC-IR-325

Do the HECO Companies' proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement require developers to pay for interconnection costs on the utility side of the interconnection? If so, please describe (a) which costs (including transmission upgrades, distribution upgrades, and storage) the developer is responsible for, and (b) how such interconnection costs are incorporated in rate calculations.

PUC-IR-326

How are the interconnection requirements and cost allocation for the proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement different from those typically borne by developers in negotiated power purchase agreements?

PUC-IR-327

According to the comments of the Solar Alliance, the proposed change to page 34A-8(d) and 34D-6(a) imposing an additional limitation of 33 percent of the feeder minimum kW load during the period when the proposed generation is available would nullify the effect of increasing the maximum limitation from 10 to 15 percent.

- (a) Do you agree with this assessment? Why or why not?
- (b) What was the reason for the additional limitation of 33 percent of the feeder maximum?

PUC-IR-328

According to the comments of the Solar Alliance, "The proposed change on 34A-2(d) and the change to the Whereas clause on page 34(C)-1, deleting language that would allow an interconnection agreement to be modified to make both the customer and third-party owner or operators of a distributed generation ("DG") system party to an interconnection agreement," would eliminate third-party financing options.

- (a) Do you agree with this assessment? Why or why not?
- (b) What was the reason for this provision? What are the benefits to the Company or ratepayers of eliminating such financing arrangements; alternatively, what harm does their presence cause?

PUC-IR-329

Please describe how the capacity factor-assumptions in the HECO Companies' calculations of Tier 1 and Tier 2 CSP rates consider Hawaii-specific factors and performance. How representative is the data used for CSP systems in Hawaii?

PUC-IR-330

Please provide underlying calculations and supporting calculations for all land-purchase or lease-cost assumptions used for the calculation of Tier 1 and Tier 2 rates.

PUC-IR-331

Did the HECO Companies' rate calculations include an escalator for land lease costs? If so, describe the size of the escalation. If not, please describe why such an escalation would be inappropriate.

PUC-IR-332

HECO's proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement wind projects would receive 16.1 and 13.8 cents per kWh respectively. Please describe the factors that would make these smaller wind projects more economical, thus featuring a lower rate than the recently signed agreement with the 30-MW First Wind facility, which includes compensation of 17 cents per kWh with an escalator.

PUC-IR-333 – To HECO Companies, SA, and HREA

Do owners of Tier 1 projects, such as residential PV solar systems, typically use debt to finance projects? If so, is such debt financing available? If so, under what typical debt rates and terms? If not, what are the typical sources for financing Tier 1 projects?

PUC-IR-334 – To HECO Companies and HREA

Under the HECO Companies' proposed model, would the total cash flow for any of the proposed Tier 1 and Tier 2 rates be negative for a calendar year? Please describe any such instances.

PUC-IR-335 – To HECO Companies and HREA

Did the HECO Companies assume the same wind speed and thus capacity factor for Tier 1 and Tier 2 wind projects? Would such projects have different elevations such that they would experience different wind speeds? How would the wind speeds differ for Tier 3 projects based on hub height?

PUC-IR-336 – To HREA

In what year was each of the wind projects listed on page 5 of HREA's Comments and Recommendations Regarding HECO's FIT Tariff Filing and Certificate of Service installed? Have costs for small wind turbines changed in recent years? If so, how?

PUC-IR-337 – To HREA

Please provide a full and detailed narrative explanation and any supporting documentation for why the Jacobs 20-kW and Aerostar 30-kW turbines “are not being seriously considered by industry for Hawaii at this time.”

PUC-IR-338 – To HREA

Please provide a full and detailed narrative explanation and any supporting documentation for why the appropriate debt term for Tier 1 projects is ten years, as stated on page 9 of HREA’s Comments and Recommendations Regarding HECO’s FIT Tariff Filing.

PUC-IR-339 – To Solar Alliance and HREA

According to page 8 of the HECO Companies’ proposed Schedule FIT Tier 1 and Tier 2 Tariff and Agreement:

“Development costs, permitting costs, and interconnection & electrical costs for Tier I were developed from the NREL Bergey study, which details the line-by-line cost of installation of 10-kW Bergey turbines at a variety of locations in the Pacific Northwest.”

Were the interconnection costs developers incurred in the NREL study comparable to those that the HECO Companies propose? How else might the costs in Hawaii be different from those in the Pacific Northwest? Describe any adjustments made to reconcile such differences when calculating rates.

PUC-IR-340 – To Sopogy

According to page 6 of Sopogy’s comments on the HECO Companies’ proposed Tier 1 and Tier 2 rates:

“The Company estimates the fixed O&M costs for CSP technologies to be approximately \$584 (or \$29/kW) a year for a Tier 1 facility and \$45,707 (\$91/kW) for a Tier 2 facility.”

- (a) Please describe the basis for these cost estimates. Include any underlying calculations and citations.
- (b) Why would the fixed costs be several times higher for Tier 2 projects than Tier 1 projects? Please provide support for this claimed diseconomy of scale.

PUC-IR-341 – To Sopogy

According to page 6 of Sopogy’s comments on the HECO Companies’ proposed Tier 1 and Tier 2 rates:

“The Company estimates the variable O&M costs to be approximately five percent (5%) of the capital cost of the facility, or \$24/MWh for Tier 1 facilities and \$11/MWh for Tier 2 facilities. These costs may vary, however, depending upon whether the facility is driven by traditional larger-scale CSP technologies or smaller-scale technologies.”

Please provide any calculations supporting a 5% per-year variable on O&M costs in addition to the fixed O&M costs.

PUC-IR-342 – To Zero Emissions

Please provide all calculations and support for all assumptions, including component costs, used to develop Zero Emission Leasing's proposed Tier 1 and Tier 2 rates.